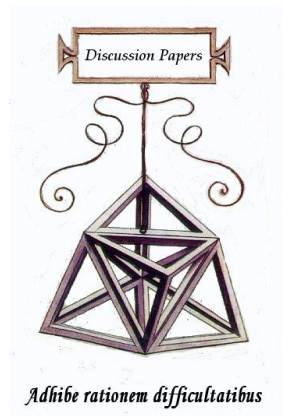




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Green purchases: an analysis on the antecedents of eco-friendly consumer's choices

Discussion Paper n. 207

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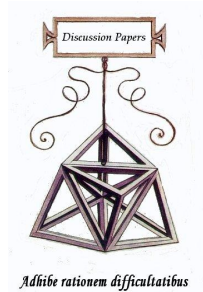
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Abstract

A widespread opinion is that present human societies rely on models of production and consumption that have been shown to be dangerous for the ecosystems and unsustainable in general. On the supply side, developing innovative resource-efficient processes can bring changes. On the demand side, any policy aimed at changing individual consumption behaviour requires understanding its drivers. The present paper focuses on consumer's actions in relation to pro-environmental outcomes. The survey of the literature highlights some relevant models of decision processes concerning eco-friendly behaviours and related drivers. In the light of the survey, we elaborate a theoretical framework useful to analyse data extracted from an already submitted survey. The dataset contains information about drivers and environmental awareness in the shopping behaviour of 8001 consumers in the retail sector. The econometric estimates are consistent with the theoretical framework, adding also some new relevant hints. Among our main findings are the lack of the "Attitude-Behaviour Gap", the importance of the general concern for environmental issues and the link between ethical values and pro-environmental inclinations and behaviours.

Keywords: Attitudes, Attitude-Behaviour Gap, Consumer choice, Environmentally Significant Behaviour, Green purchases, Life-Cycle Assessment, OLS regression model.

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1. INTRODUCTION

Can societies reconcile current levels of wellbeing with the scarcity of environmental resources and ecosystems' limits in absorbing human waste? In which manner current lifestyles and modes of production can be made more sustainable? Public discourses and policy-making processes often deal with these questions, which, however, are particularly complicated since causes and effects of human well-being and ecosystems' functioning are interconnected at different levels. Life quality, with its cultural, social and personal values, depends essentially upon the structural characteristics of our consumption and production systems (e.g. Testa *et al.*, 2015), which are major contributors to the degradation of natural resources (e.g. Sweeney *et al.*, 1997, Preface, vii).

Economic theory teaches that, in the presence of externalities, markets fail to deliver the efficient outcome. Externalities are side effects of production or consumption affecting agents that are not involved in the decision of producing/consuming that particular good or service. In particular, when externalities are negative, competition causes the price of a good or service to fall below the “true” marginal cost of producing it. Such a “true” marginal cost is the “social marginal cost”, including both the private costs and the damages suffered by third parties indirectly affected by the economic transaction. Hence, economists see environmental degradation as caused by the difficulty of inducing economic agents to account for all the side effects of their action. In order to change economic incentives and solve the problem, economists recommend either taxation or the creation of new markets for externalities by better defining property rights. Both solutions, however, are difficult to implement in practice.

In our opinion, this conventional view has some shortcomings. The major one is that the analysis stops just before attacking the root of the problem, that is, what is the nature of externalities, where do they stem from and which is their extent. Actually, an asymmetry exists between consumers and firms. Consumers have some power in deciding the extent of the externalities they induce (that is, by avoiding or taking actions whose costs are born also by other individuals). For instance, a (selfishness and rational) motorist who speeds up usually includes in his calculations only the increased consumption of gas, but not the increased social costs due to the increased emissions. But, still, (s)he is free to consider also the external costs. A major Kapp's contribution was to emphasise (Luzzati, 2009) that enterprises are not free of taking into account the external costs they provoke. Competition prevents them to take into account the external costs that they produce. If they did, they would be expelled from the market. Hence, economic theory would greatly benefit by admitting both that externalities are ubiquitous and

that firms in a competitive environment attempt to shift costs outside the firm as much as possible.

Indeed, policies based on consumer preferences for a cleaner environment (e.g. eco-labelling) attempts to induce firms reducing their exploitation of negative externalities. The idea is that consumers who care about the environment are willing to pay a higher price that includes the “social marginal cost”. At the same time, due to asymmetric information, is difficult for firms to prove that they do not cheat and that are actually reducing externalities. Moreover, by greening their products, firms also differentiate them and get, at least in the short run, some monopolistic power that makes the price higher than the true marginal cost.

This paper aims to contribute to the consistent body of research that explores the environmental-related dimension of consumption choices. The number of consumers concerned about environmental implications of household practices and purchases has grown sharply in the last decades. “Green marketing” (see *e.g.* Polonsky, 1994) and “environmental management” (Pane Haden et al., 2009, 1052; Porter & Van der Linde, 1995) are concepts reflecting a new level of consciousness that entered today’s academic as well entrepreneurial milieus. Alongside that, several regulatory policies for reducing the impacts of production has been introduced.

Exploratory analyses on the consumer’s side unveil connections and causal chains between environment-related conditions and human actions. Given the importance of shedding light on the psychological processes and the external factors which lead people to select certain products, companies and/or brands, Economics, Marketing and Psychology attempt to improve the current understanding on patterns and mechanisms underlying consumption choices. In the present work, main research questions are about:

- factors that encourage consumers to buy green products and factors that hinder environmentally friendly purchases;
- steps and variables involved in the thought processes leading to “environmentally significant consumer behaviour” (Stern, 2000, 408,409; Gatersleben, Steg & Vlek, 2002);
- extent of the discrepancies between what consumers declare they would like to buy and what they actually do.

The first part of the paper (Section 2) focuses on explaining eco-friendly behaviours. The analysis of some renowned models (Section 2.1) allows us to define a theoretical framework (Section 2.2) that served as a basis for an empirical analysis. The dataset we used derives from an already submitted survey in the retail sector providing information about personal awareness in the shopping behaviour of about 8000 consumers. Section 3 introduces the questionnaire,

describes the available variables and reports the estimates. Section 4 discusses the results. Section 5 concludes.

2. THEORETICAL SETTING

2.1 Explaining Environmentally-Significant Behaviour

Stern (1997; 2000) defines “environmentally significant behaviour” either in the light of its actual impacts on the natural environment or by the agent’s intention. In this paper, we focus only on the processes that drive consumption choices from the individual perspective.

Psychology and Economics represent behaviour with coherent models that account for factors that are both external and internal to the agent and deal also with limitations of human rationality. The Theory of Planned Behaviour (TPB) (Ajzen, 1991) has been widely used by marketing scholars as theoretical framework for consumer research. In such model, each behaviour results from an Intention to behave, which in turn is influenced by “behavioural attitude(s)” (BA), “subjective norm(s)” (SN) and “perceived behavioural control” (PBC). BAs express the degree to which the person has a favourable or unfavourable evaluation or appraisal of the behaviour (and actions) in question. SNs constitute the perception of social pressure to perform or not to perform the action. PBC expresses the subjective self-confidence (expected ease or difficulty) to accomplish the behaviour, given the resources available to the individual. Although attitude is a major antecedent of intentions and intentions are expected to be basically consistent with behaviours, other factors can intervene and moderate the previous relationships. Habits, emotions and external factors have been assigned an explicit role in shaping final behavioural outcomes.

For instance, Fishbein developed a scheme (see Figure 1), named “Integrative Behavioural Model” (IBM, 2000), to account for those variables that can influence behaviour. Fishbein’s framework draws on Ajzen’s Theory of Planned Behaviour and on several other social cognitive models (Glanz *et al.*, 2008) and is aimed to better inform theory-based behaviour change programmes. In the IBM framework, any Behaviour is preceded by an Intention to act, but depends also on the possession of required Knowledge and Skills for the specific action/behaviour in question. The same behavioural occurrence is influenced also by the previous Habit(s) that the person has (favouring or hindering the concerned action) and, finally, on the presence (absence) of Environmental Constraints.

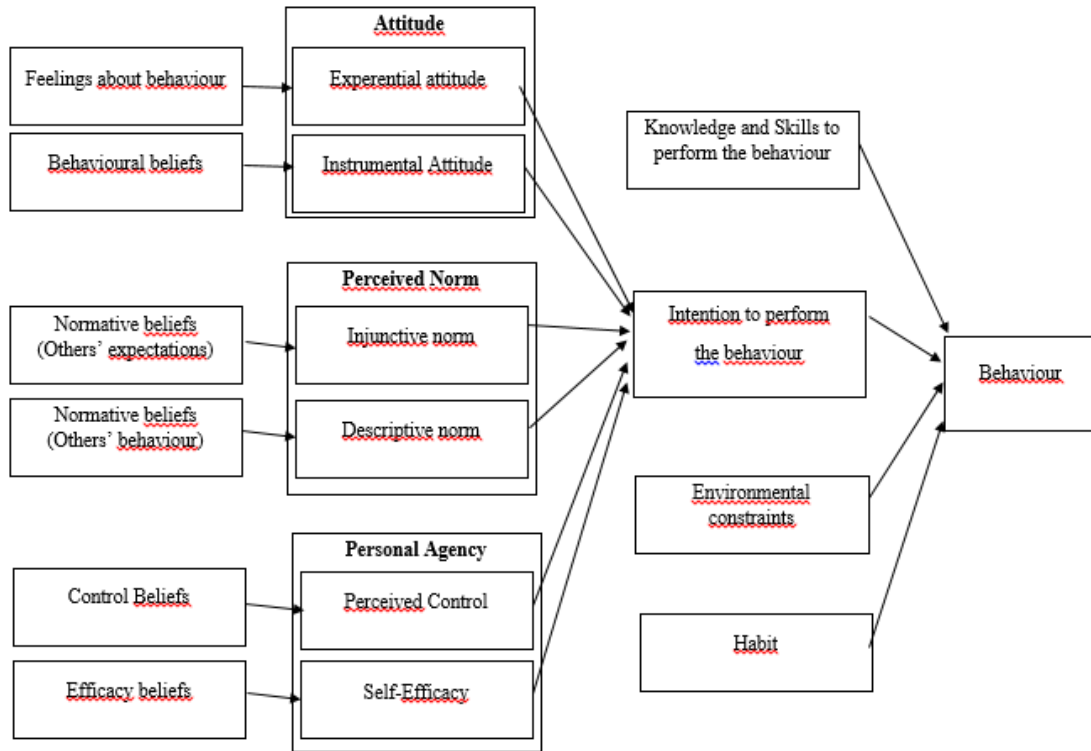


Figure 1: Integrated Behavioural Model (adapted from Glanz et al., 2008, p.77)

In presenting his model, intended for nudging “ ‘healthy’ behaviour ” and discouraging ‘risky’ ones (e.g.: in the domain of HIV prevention), Fishbein stresses how any behaviour change intervention can be more effective if tailored to *specific* behaviour(s). The specificity of each individual bearing is identified by a combination of 4 elements (the action and the target, the time and the context of performance).

The importance of focusing on specifically defined behaviours and the latter’s embeddedness into a wider social context are implicitly recognized by Stern, 2000: his Value-Belief-Norm (VBN) theory is a causal framework focusing on the personal-sphere behaviour of non-activist individuals in support of the environmental movement. A non-activist can support the environmental cause in his/her private sphere in basically three different ways, among which “consumer behaviours such as reductions in energy use and purchases of environmentally benign products” are specifically cited (Stern *et al.*, 1999, p. 82). The VBN Theory explains non-activists’ environmentalism in terms of the causal chain reported in Figure 2.

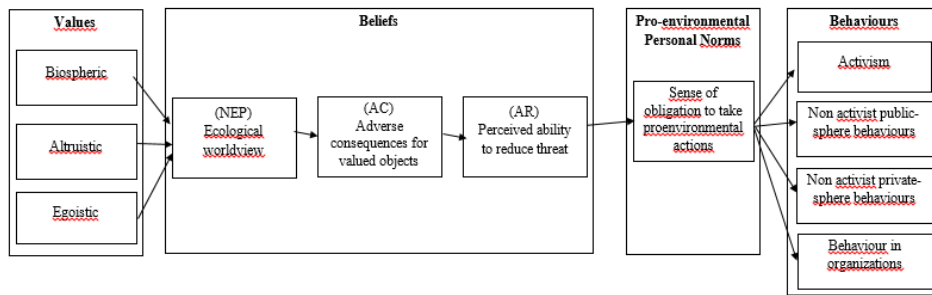


Figure 2: Value Belief Norm Theory of environmentalism (adapted from Stern, 2000, p. 412)

According to the VBN, any ‘green’ behaviour is the final step of a causal, hierarchically organized chain that unfolds from individual basic Values to elements that are progressively more specific with respect to the action and the possible (intended) outcomes under evaluation. Causality moves from personal Values, conceptualized as general and time-stable for each individual, as they are constructed in life earlier than beliefs and attitudes. Altruistic connotations of values, together with positive evaluations attached to elements of the biosphere, can act as positive triggers (while egoism does the opposite). The chain moves to beliefs regarding the interconnectedness between humans and the biosphere (“New Environmental Paradigm” or NEP), then to personal feelings that environmental conditions could threaten things valued by the individual (AC, *alias* awareness of Adverse Consequence). This involves activating the person’s Ascription of Responsibility, identified by the individual’s belief that he/she can act to reduce the threat (AR). This concatenation of elements condensates into activating Pro-environmental Personal Norms, which create a strong and positive predisposition towards all kinds of pro-environmental actions, so that the individual feels as obliged to take an environmentally concerned action (such as buying an eco-friendly product).

VBN model posits a special focus onto mechanisms that involve the inner value-system and judgmental rationality of individuals. Nonetheless, Stern points out that also habit (“standard operating procedure”, Stern, 2000, p. 418) and personal capabilities¹ have a word onto the final choice. Although their models focus on elements that lie within the boundaries of individual belief-structure as well as norms, personality traits and individual volition, both Fishbein and Stern recognize the ascendance of factors outside of these boundaries. Stern (2000) labels as “contextual factors” the interpersonal norms and expectations, laws, regulations and policies, technology state-of-the-art and advertising. Nonetheless, also the Fishbein’s IBM model

¹ In empirical settings “Personal capabilities” have often been proxied with information about socio-demographic status.

accounts for a number of external constraints, among which there is also the population-specific culture.

A number of scholars discussed how some conditions, which are mostly independent of the individual, can lead to a dissociation between a person's intent and his/her realized behavioural outcome. The role of external constraints is discussed more extensively in the so-called "Attitudes, Behaviours and [external] Conditions" model (ABC, Guagnano, Stern & Dietz, 1995). Here, the external sources of support or opposition to behaviour (physical, financial, legal, or social) are very relevant in determining final actions. Critical is the interaction effect between 'Attitudes' and 'Conditions', owing to which personal dispositions can be offset (or reinforced) by external variables that induce to give up (or to perform) the action. Other authors noted that the most positive outcomes in terms of environmentally oriented behaviour are achieved when internal and external factors act synergistically and there are few barriers (Kollmuss & Agyeman, 2002). When this is not the case, conflicting drivers can actually offset the environmental attitude's influence towards the purchase of "green" products and lead to the emergence of the so-called "attitude-behaviour gap" (e.g. Moser, 2015; Gupta & Ogden, 2006; Kollmuss & Agyeman, 2002; Wagner, 1997; Mainieri *et al.*, 1997). Furthermore, "Environmental concern influences ecological behaviour primarily in situations and under conditions connected with low costs and little inconvenience for individual actors" (Diekmann & Preisendörfer, 2003, p.443): in other words, emotions, attitudes and other subjective factors gain relevance in explaining actions if external limitations are not excessively adverse. Blake (1999) discusses the "Value-Action gap" with a model that in its components is similar to the Stern's VBN chain, but is seen more in terms of the "barriers" that could prevent the individual from actually engaging in a pro-environmental behaviour. Among these barriers, (positive attitudes towards *non* "green" elements can prevent the individual from engaging in a pro-environmental behaviour.

Assessing pro's and cons' of the different models, we got persuaded that a comprehensive empirical analysis of pro-environmentally intended actions has to combine some elements of the Stern's Value-Belief-Norm Theory (VBN, Stern, 2000) and of the Fishbein's Integrative Behavioural Model (IBM, Fishbein, 2000). The framework that we propose is represented in Figure 3 (The reason why some boxes are grey will be explained in the next section). Such a structure is deemed suitable to be applied to the particular dataset that was available to us, extracted from a survey that had been already submitted at the time of our analysis.

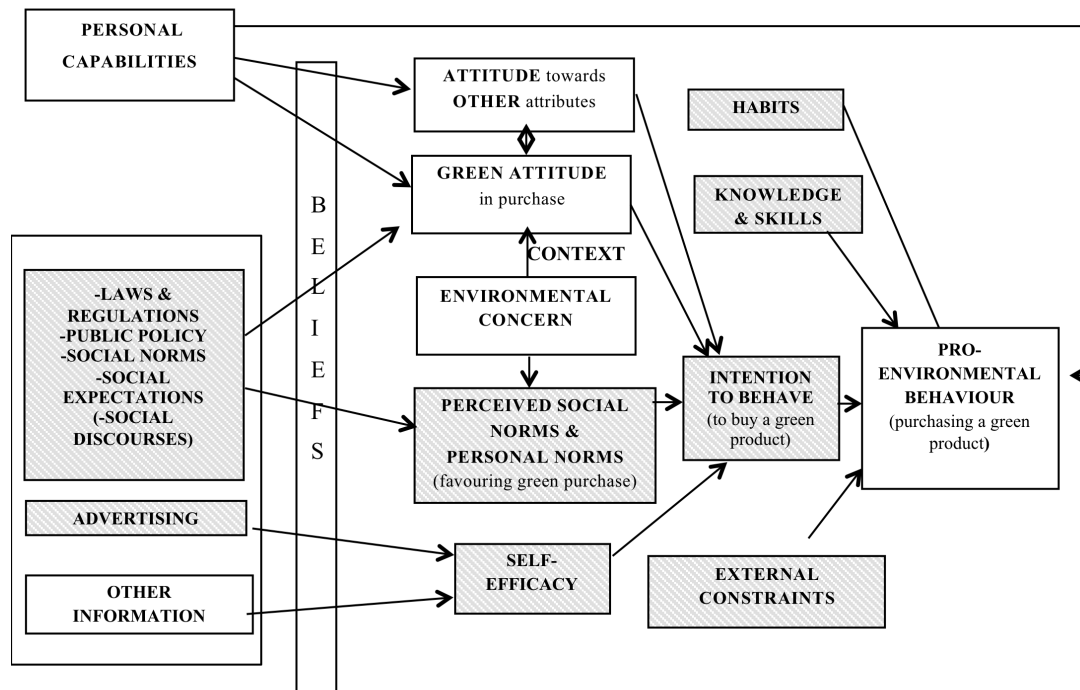


Figure 3: integrative model for green purchasing behaviour

Such an integrative model is similar to the IBM, but has the characteristic of focusing specifically on the “green” behaviour of buying a product that has a lower impact on the natural environment (a so-called “green product”). Behaviour is the result of the interaction of concurrent elements that influence the individual on the final decision. The intention to perform a specific behaviour is considered a primary driver, whose intensity can be enhanced (weakened) by the possession (lack) of necessary knowledge and skills to perform the action (e.g.: do I know where I can buy a certain green product?) or by other habits being in place (e.g.: I am used to refer to a certain distribution chain, that does not sell a “green line” of the product needed) and external constraints to the action (e.g.: the product is not available). Intention, on its part, has a number of drivers. Among these, we find the positive attitude towards green products (hereinafter referred as GA), that is the value attributed by a lower impact of the product on the environment. However, GA, in order to “activate” the behavioural intention, should be strong enough in order not to be offset by positive evaluations of other attributes of the product (e.g.: I may like the low environmental impact, but I prefer to buy a product with a lower price). In this framework attitudes derive from some beliefs, often dependent on our socio-economic conditions and living-standard (all these things going under the label of “personal capabilities”, that basically delimit individual scope for action).

Also the decisions of policy makers at a higher level (in the form of laws and directives) can influence our beliefs and thus the appraisal of green products. Each individual is embedded into a social context in which the preservation of the environment is often mentioned as an ideal primary goal (and moral duty) of everybody: perceived norms and social expectations can exert a pressure and modify outcomes, also according to the sensibility of the person for the concerned issues or the individual's vulnerability to others' judgements. Finally, the self-efficacy beliefs can enhance one's feeling that he/she has the concrete possibility of committing to a certain action and to carry it out. Also the variable of "environmental concern" is part of the present integrative model. The individual concern about environmental problems has been usually referred as an attitude, both specific with some role in the formation of intentions to particular behaviours, or more broadly as a general value or orientation: "...has been treated as an evaluation of, or an attitude towards facts, one's own behaviour, or others' behaviour with consequences for the environment" (Fransson & Gärling, 1999, 370). Older theories tend to trace the genesis of this construct to personal factors as education, age, income, gender and the like (Fransson & Gärling, 1999, 370). Stern *at al.* (1995) conceives the environmental concern basically as a function of risks perceived as threatening certain entities important to the person. According to personal value system, environmental concern can activate the personal moral norm for acting.

2.2 A framework for an empirical analysis.

The theoretical framework proposed at the end of the previous section had to be adapted to the data and the indicators available to us, whose nature depended on the specific questions submitted to respondents. In Figure 3, boxes in grey are referred to variables for which no indicators were available in our database. We could not explore some of the potential links affecting green purchases and we limited our analysis to the causal model represented in Figure 4. Black lines are the conjectures that have been tested. We used the information about age, gender and level of education of the respondent to proxy the personal capabilities; "Environmental concern" relates to the inner part of the individual, and its elicitation is likely to be shaped also according to the social context (culture and discourses) surrounding the decision-maker: in the light of what has been said in the previous section, it is deemed to correlate both with personal norms and personal green-product attitude. As contextual factors, we had a measure the person's knowledge of the meaning/content of certain low-impact certification schemes and product eco-labels. We deem that the existence of schemes for green products (endorsed by high-order public Authorities) can be perceived as a sort of social norm, eliciting one's intentions to take an eco-friendly decision.

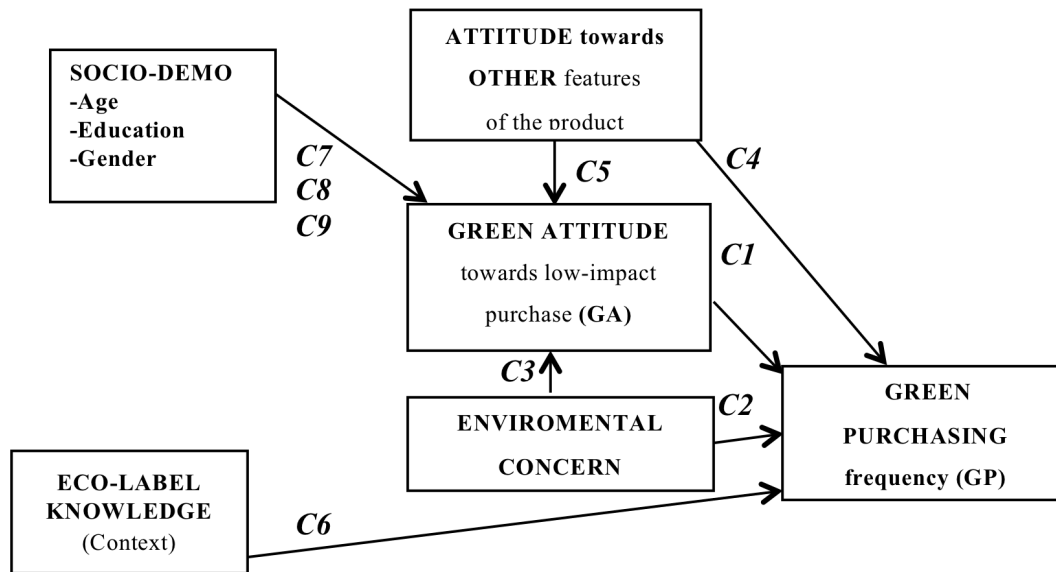


Figure 4: *The adapted model for our empirical analysis.*

Below we will describe the conjectured links that have been empirically tested and that are visualized by the black lines in Figure 4.

One of the most important issues is whether declaring a positive attitude towards the choice of low-environmental-impact goods is a good predictor of its purchase, that is, to test the absence/presence of an “attitude-behaviour gap” (as discussed above).

C1: GA significantly determines GP (Blake, 1999; Kollmuss & Agyeman, 2002; Moser, 2015)

Another interesting aspect is about the concern for the environment. Ecological problems at the global level have become broadly-debated issues; in Diamantopoulos *et al.* (2003, 465) concern about environmental issues was found to positively affect decisions to buy green products, although it has been shown not sufficient neither necessary (Ha & Janda, 2012; Testa *et al.*, 2015). Quoting Fransson & Gärling (1999, 378) “...the same [pro-environmental] behaviour may be performed for different reasons (e.g. normative or attitudinal) [...] if all other factors are equal, increasing environmental concern should increase the likelihood that a pro-environmental behaviour is performed.” So, we test the following conjectures:

C2: Environmental concern is a significant and positive correlate of GP.

C3: Environmental concern affects GA. Since other product’s features have a potential influence both on GA and GP, we test the significance of other indicators through the following conjectures:

C4: Attitude toward price is a significant barrier to GP (Padel & Foster, 2005, 18-19; Young *et al.*, 2008; Moser, 2015, 171).

C5: Attitude toward perceived product quality is a positive driver of GA (Chang, 2011, 23).

If confirmed, the latter conjectures are relevant for marketing practitioners interested in understanding whether the evaluation of some characteristics of the product could favour or hinder selection of “green” products.

Moving to contextual factors (see section 2.1), we were constrained by the availability of indicators. Consumers’ knowledge of the meaning of some environmental certification could have an effect on GP, also because it could enhance the perceived behavioural control (see section 2.1)

C6: Eco-labels knowledge is a positive driver of with GP (Sammer & Wüstenhagen, 2006; Testa *et al.*, 2015; Moser, 2015).

Finally, some authors (Roberts, 1996; Kollmuss & Agyeman, 2002) focus on socio-demographic variables and report that they are associated with measures of green attitudes, but have weak explanatory power. From Diamantopoulos *et al.* (2003, 475, 476), Chen & Chai (2010) and Mainieri *et al.* (1997), one can expect that:

C7: Age is a negative driver of GA.

C8: Level of education does not affect GA.

C9: Gender does not affect GA.

3. AN EMPIRICAL ANALYSIS

3.1 Dataset

Our data derive from a survey prepared and submitted in 2010 by “ANCC-Coop” (a large Italian retailers’ association together with a delegation of Legacoop Consumers) within the project PROMISE (PROduct Main Impacts Sustainability through Eco-communication), the European initiative aimed to acquire information on the general awareness about product-related environmental impacts. The online survey involved retailers, producers, Public Administration

and consumers registered on the “Coop” website. Questionnaire’s structure and results were released to us by the Sant’Anna - Istituto di Management, Pisa, Italy.²

The database relative to the consumer section was rather large, containing information relative to 8.001 respondents. The 79% of them aged between 36 and 65 and had, on average, a medium-high level of education. The sample was quite equally divided between male and female individuals (52% vs. 48%).

Questions employed a very simple language without complicated syntax and had been framed so to reduce the risk of leniency or social desirability bias in respondents (Testa *et al.*, 2015). As often assumed (e.g. Hines, Hungerford & Tomera, 1987) we considered self-reported information adequate for carrying out a quantitative analysis. Respondents were firstly asked to indicate which, in their opinion, are the most worrying environmental problems among the following: *Climate change, Air pollution, Water pollution, Waste production, Resource consumption, None of the above mentioned*. The second question was about the environmental relevance of six distinct product’s life-cycle phases (*Packaging, Disposal and recovery of materials, Use of recycled materials in the production process, Manufacturing process’ consumption of resources (impact), Point of Production-Point of Sale Distance, Number of steps in production chain*) in determining purchasing choice. Their importance was measured through a five-point Likert scale (0=“*I don’t know*”, 1= “*Not important at all*”; 2=“*Not so important*”; 3=“*Quite important*”, 4=“*Very important*”). Respondents were then asked to assign to product’s attributes (*Price, Quality, Low-Environmental Impact, Brand, trust in the Point Of Sale, Safety, Socio-Ethical aspects*) a score expressing the extent to which each attribute influences their purchasing choice. A five-point Likert-scale ranging from *Always, Often, Seldom, Never, I don’t know* was employed to code the self-reported frequencies of purchase of eight categories of household consumer goods and agro-food products (*Organic food products, Local food products, In-season food product, environmentally-certified fabric clothes, Energy-efficient electrical/electronic goods, Low-impact cleansing household products, Ecological paper, Eco-friendly furniture*) Lastly, it was assessed whether the respondent was correctly informed about the meaning of some environmental certifications used in the European countries (*FSC/PEFC; Ecolabel; the energy [consumption] label for electric products*³). Multiple-choice questions

² The dataset the same on which Testa *at al.*(2015) relied for their inquiry about eco-labels’ knowledge and buying choices of ‘ecological paper’ and ‘green home cleaners’. Similarities arise from the fact of relying on a common set of indicators available. However, the theoretical settings and the statistical methods employed by the two studies are largely different from each other.

³ All the above-cited labels are based upon standard-certification schemes whose rules are public and released by Public Authorities: we purport that such a kind of labels should convey a quite satisfactory degree of clarity and

asked what was the label standing for. As a result, for each certification label only one out of three customer gave the correct answer. An overview of the answers shows that most respondents had some concern for environmental issues, with less of 0.5% reporting no specific worries about any of the environment-related problems they were asked about. Many respondents declared their tendency to account for product's low environmental impacts when shopping. It is interesting that the percentage of those assigning a score higher than 7 to "low-impact" attribute was the same of those attaching the same score to price, which is traditionally considered as a major purchasing driver.

3.2 Variables

Given the theoretical framework described in section 2.2 (and summarised by figure 4) we regressed green purchases frequency (GP) on a selection of the variables. Indicators are described below.

Green purchases behaviour (GP) is the dependent variable. It was proxied by the *self-reported frequency of purchases* for eight green products. We obtained this variable by summing up the frequency scores of each product. It is an integer number ranging from 0 to 32.

The indicator of *environmental concern* accounted for the number of ecological problems (from a minimum of 0 to a maximum of 5) reported as distressing by the respondent.

Ecolabels knowledge. We retrieved information on consumer's knowledge about the content of the FSC logo, the Ecolabel logo, and the energy-efficient certification; we assigned a point of "1" when the respondent gave the correct answer and "0" to other available options. Adding up the respective correct-knowledge score relative to the three certifications has generated the aggregate variable "Eco-label knowledge". Its value ranges from 0 to 3.

Price attitude, Quality attitude, Brand attitude, Security attitude, Ethical attitude, and Point Of Sale (POS) attitude were proxied by the respective *self-reported importance-* (in determining purchasing choices). Scores ranged from 1 (scarce attitude) to 10 (strong attitude). Among them, attitudes towards the brand and the point of sale could be conceived in terms of "loyalty to".

We proxied "*green Attitude*" by two alternative indicators. One indicator was the *self-reported importance-score* that the respondent assigns to the product feature "*low-impact on the environment*". The other indicator was an index obtained from the answers about the consumers'

credibility to users (accordingly, Testa *at al.*, 2013 recognize the relevance of these particular types of environmental claims and set their research on them.)

concern for the impacts in each life-cycle phase. The latter index, that we named “LC-Green Attitude”, was built by summing up the importance scores attributed to each one of the six life-cycle aspects (for details see Section 3.1); its value ranges from 10 to 30. The underlying idea is that, individuals should judge the “greenness” of a certain item by assessing the impacts along the product’s whole production and supply chain, that is, by examining the characteristics of the production chain “from cradle to grave” (Rebitzer *et al.*, 2004). In this sense, a person’s attitude toward green products should reflect the self-declared importance of low environmental impacts in distinct product life-cycle steps (E.g.: Sirieix, Grolleau, & Schaer, 2008; Rokka & Uusitalo, 2008). Hence, we performed our empirical analysis twice, by proxying the attitudinal factor firstly with the self-reported importance of low-impacts, and then with the scores based on the importance assigned to the characteristics of distinct life-cycle phases. The latter proxy allowed us to test whether the (declared) inclination to ponder product LC’s impact-information is translated in more frequent green shopping (see also Wagner-Tsukamoto & Tadajewski, 2006). If our sample conformed to such a kind of life-cycle thinking, our analysis should provide evidence that self-declared “LC-Green Attitude” and “Green Attitude” are related to the other variables basically in a similar way. Socio-demographic information was available on *gender*, *age* and *educational level*. Gender takes the value of 0 for female individuals and 1 for males. Age ranged from 1 to 6, these values corresponding to classes [<25], [26-35], [36-45], [46-55], [56-65], [>65]. Educational level referred to situations in which the subject stopped studying after grade school (1), middle school (2), high school (3), University (4) or post-graduate studies (5).

3.3 Estimates

As a first step, we calculated descriptive statistics about the data (see Appendix, Table A.1 and A.2). Then, in order to understand the antecedents of green purchases, we regressed it on the selected variables illustrated in the previous section. We included all the selected variables since their influence can go also through channels different than those conjectured. Moreover, we included both green attitude and variables that potentially affect it since other factors may affect green attitude. As a further step we estimated a regression for “green attitude”.

OLS Regression equations were then estimated. White’s robust standard deviations were used to correct for heteroscedasticity.⁴ Our main interest was in the significance on coefficients and in their signs, rather than in their size. Nonetheless, variables were standardised between 0 and 1 to make coefficients comparable.

The regression on “Green purchases” gives the following estimate⁵ (Table 1):

Table 1 Green Purchases regression

y = Green Purchases	<i>Coeff.</i>	<i>Std. Err.</i>	<i>t</i>	<i>p</i>
Green Attitude (self rep.)	0.144	0.008	18.79	0.000
Env. concern	0.013	0.004	3.03	0.002
Quality Attitude	-0.006	0.010	-0.62	0.533
Brand Attitude	-0.020	0.005	-4.30	0.000
Point of Sale Attitude	0.019	0.006	3.12	0.002
Security Attitude	0.052	0.009	5.93	0.000
Fairness Attitude	0.075	0.007	10.94	0.000
Price Attitude	-0.092	0.006	-15.01	0.000
Eco Label Knowledge	0.085	0.009	9.61	0.000
Age	0.078	0.006	13.40	0.000
Education	-0.006	0.007	-0.85	0.397
Gender (M)	-0.012	0.002	-5.34	0.000
C	0.508	0.011	45.87	0.000

n=8001, Adj. R-squared = 0.217

~~Strikethrough text indicates for n.s. variables~~

When using the other proxy for the green attitude, the “LC-Green Attitude”, as a regressor on GP, results are similar (see the Appendix, table A.3). The only difference is that quality attitude becomes significant with a positive coefficient. The predictive power, too, is similar to the one of the previous model ($R^2=0.245$). When moving to green attitude, we get the estimate reported in Table 2:

Table 2 Green Attitude (self reported) regression

y = Green Attitude (self-reported)	<i>Coeff.</i>	<i>Std.Err.</i>	<i>t</i>	<i>p</i>
Env concern	0.055	0,006	8,83	0,000
Quality Attitude	0.289	0,015	19,79	0,000
Brand Attitude	-0.044	0,007	-6,42	0,000
Point of Sale	0.000	0,009	0,02	0,982
Security Attitude	0.055	0,013	4,25	0,000
Fairness Attitude	0.447	0,009	51,47	0,000
Price Attitude	0.060	0,009	6,78	0,000
Eco Label Knowledge	0.080	0,013	6,21	0,000
Age	0.024	0,008	2,80	0,005
Education	-0.016	0,010	-1,57	0,117
Gender (M)	-0.006	0,003	-1,89	0,059
C	0.046	0,016	2,81	0,005

n=8001, Adj R-squared = 0.4149

⁵ There is no evidence of multicollinearity and residuals are normally distributed

When using the other proxy for green attitude, the “LC-Green Attitude”, the regression of it on other variables yields results similar to the ones regarding GA in the self-reported, but for the following differences. Education becomes significantly and negatively related to the “LC-GA”, the Point Of Sale attitude shows a significant and positive coefficient, while quality loses its significance. The significance of gender increases. Finally, the coefficient for Price attitude becomes negative, which is more reasonable. For details see the appendix, Table A.4.

4. RESULTS AND DISCUSSION

Empirical results are now presented by following the integrative model presented in Section 2. A major aim of the present study was to assess whether GA is a driver for GP (C1 as stated in section 2.2) or rather whether the sample gives evidence for an “attitude-behaviour gap”. In the present sample we could not find evidence for this gap. The coefficient of green attitude in the regression of green products is significant and positive, both when we consider green attitude as self-reported and as LC-proxy. Moreover, the coefficient of green attitude is the highest as compared with the ones of the other regressors. Since the context was shopping in a retail store, this evidence is consistent with the “Low-Cost Hypothesis” (see section 2.1) according to which in “a low-cost domain [...] green behaviour is feasible with low behavioural costs and little inconvenience” (Moser 2015, 168). At the same time, the relevance of “green attitude” for green purchases in this sample could be also a result of the efforts of the Coop retail chain to base its CRS strategy on environmental and ethical values⁶.

Another important issue is the role of environmental concern both for green purchases and green attitude. Actually, the regressions support conjectures C2 and C3, that is, that environmental concern is a relevant driver for both GA and GP. This result confirms previously mentioned findings and disproves the so-called “correspondence rule”, according to which worries on ‘general’ ecological problems do not motivate an attitudinal propensity to perform ‘specific’ micro-level behaviours, such as buying a certain eco-friendly product (see Diekmann & Preisendörfer, 2003, 442). As expected, price sensitivity negatively affects the frequency of eco-friendly purchases (GP) (conjecture C4). Spending power is a facilitating factor for paying premium prices for eco-friendly products. In light of this, it would have been useful to have some measure of personal/family economic conditions. Conjecture C5 stated that quality attitude might be correlated with GA. Indeed, the regressions show a positive role for it. If GA is proxied

⁶ The significance and the positive sign of the “Loyalty to the point of sale” coefficient in the regression explaining green purchases suggest an evidence for the importance of the CSR strategy of Coop.

by the self-reported measure, quality attitude is an antecedent of green attitude, which in turn affects green purchases. If GA is proxied by life-cycle evaluations, attitude to quality appears to affect directly the Green Purchases without being mediated by GA.

The only contextual factor investigated was the knowledge about eco-labels, which was supposed to be a facilitator of GP (C6). This is confirmed by the estimates, which suggested also a positive role in determining green attitude. This could be explained by a potential reduction in consumers' sensation of "risk" triggered by environmental quality accreditation (Sammer & Wüstenhagen, 2006) that, in turn, drives formation of attitudes.

Moving to the socio-demographic variables, the estimates suggest that older people have a higher green attitude (C7 was confirmed) and also higher frequencies of green behaviour (GP), and this is in line with findings of Diamantopoulos et al. (2003) and D'Souza *et al.* (2007). The lack of interest of younger generations in environmental issues and pro-environmental actions is a quite worrying and should be addressed by public educational programmes upon ecological themes. Conjecture C8 was relative to the role of years of schooling. Consistently with the literature, our sample does not suggest a significant role of education. On the contrary, and differently from other papers, men were found to have slightly less GA (conjecture C9) and also to "buy green" less frequently than women (GP).

Important indications come also from some of the control variables. Fairness features of products affect positively GP, both directly and via GA. In particular, the coefficient of fairness on GA is by far the highest⁷. Moreover, when omitting it in the GA (self-reported) regression the adjusted R-squared goes from 0.41 to 0.22 (and from 0.22 to 0.12 for the LC-GA). The positive influence of fairness attitude is consistent with the evidence of a negative impact of brand attitude, both on GA and on GP. The reason is that transnational corporations and brands are often associated with unfair labour exploitation or insufficient care for ecological issues. Consumer's inclination towards brand reputation and fashion could be classified as "conflicting attitudes" hindering the maturation of green consciousness (*e.g.* Blake, 1999).

Finally, we shortly highlight the main limitations and caveats of our empirical analysis. Firstly our sample suffered from self-selection bias, since Coop, as mentioned above, is active in promoting green attitude and behaviour. Being consumption habits very context-dependent, it is important to compare evidence across firms and across countries. Another possible limit is that many data were self-reported. Although a number of studies used this kind of data (see *e.g.*

⁷ The coefficient of Fairness on GA (self-reported) is 0.447 while the second highest is the coefficient of quality attitude which is 0.289.

Hines, Hungerford & Tomera, 1987; Testa *et al.*, 2015), other authors maintain that, when environmental responsibilities are involved, people often fail to report correctly what they actually do (Mosainder *et al.*, 1997; Moser, 2015). It would be better to rely on the actual frequency of green purchases by drawing data and information from consumers' fidelity cards. The database lacked also information about respondents' income level. Finally, the questionnaire did not asked if the respondent was (or not) the "gatekeeper", that is, "the people who make purchasing decisions and regulate what the other members of the household eat" (Tanner & Kast, 2003, 885).

5. CONCLUSIONS

The present research aimed to unveil the relationships between inner-personal or contextual factors and the act of purchasing products with low environmental impact. The review of the literature allowed us to set a theoretical framework that was used to empirically analyse a big sample of 8001 consumers of an Italian retailers' organization that gathered the data⁸. Hence, our research was about the formation of environmentally conscious choices of consumers in shopping situations.

Our main findings are that the sample does not support evidence for the "Attitude-Behaviour Gap". On the contrary, we found strong evidence of a positive relationship between the pro-environmental attitudes (GA) and the self-declared frequency of green purchases (GP). Other variables confirm most of our theoretical framework (and the findings of the literature). Concern for general environmental issues, attitude for the quality of the product, knowledge about eco labels affect positively green purchases and/or attitudes.

However, the potential of eco-labels stems from making consumers aware of certifications' requirements and label-provided warranties and, thus, enhance consumers' trust. Actors on both the demand- and the supply-side need sufficient information and assurances that what is certified is really "pro-environmentally significant" under an impact point of view (see Stern, 2000).

Both attitudes for brand and price have a negatively influence. As long as eco-friendly products are much more expensive than their grey substitutes, green consumption is unlikely to spread widely.

⁸ The theoretical model, together with the statistical methodology, differentiate our piece of research from the study of Testa *et al.* (2015), which relied on the same dataset for drawing considerations upon the eco-labels' effectiveness in motivating the development of low-impact purchases.

Differently from other studies, older people seem more prone to eco-friendly commitment. Men are instead less likely to buy green products. Education does not appear significant in environment-related consumption choices. Results on control variables provided important insights, especially about the role of attitudes towards fairness of the product, brand, and towards the point of sale. The empirical link between ethical values and green concerns supports the Pro-social Behavioural Models, according to which people showing pro-social (rather than egoistic) orientations are more likely to buy things that do not threaten natural resources and next generations' rights (see Kollmuss & Agyeman, 2002). This is confirmed by the negative impact of brand attitude on green purchases, since consumers often associate transnational corporations or luxury brands with labour exploitation and/or insufficient attention for ecological issues. Individuals express their ethical values also in their consumption choices (see also Sciarelli, 2008) by rejecting branded products, in a sort of pro-environmental boycotting or even anti-consumerism (see Lewis & Potter 2011).

The loyalty towards the point of sale is positively significant for green purchases. This can be linked to the efforts made by Coop to build a corporate image around the values of sustainability, fair compensation of labour, as well as of secure origin and affordability of products (product features whose importance was scored quite highly in the present sample: see Table A.1). Information on ecological implications of products is often difficult to find or it is disclosed only partially (Tadajewski & Wagner-Tsukamoto, 2006). Retailers play a major role in providing consumers with adequate information and can enable them to choose more responsibly. It would be interesting to test the same models on green attitude and green purchases in consumer samples, and especially among customers of retail chains with a less CSR commitment (*e.g.* in convenience stores).

The present analysis referred to two different proxies for the “green attitude”, one self-declared the other calculated from questions about the “life-cycle thinking” of consumers (LTC). The latter involves a deeper appraisal of product environmental impacts and, as suggested by our empirical results, is a positive driver of green purchases. In the light of the above, research questionnaires should take seriously the issue of life-cycle-oriented information processing, while marketing practitioners might usefully launch communication campaigns about products' life-cycle aspects and impacts. This would benefit not only those firm interested in an environmentally-oriented strategy, but could also raise people's awareness about products that they buy and use daily and it may even foster reconsideration of their lifestyles.

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APPENDIX

TABLE A.1.

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Err.</i>	<i>Min</i>	<i>Max</i>
Green Purchases	8001	0,72	0,11	0,03	1
Green Attitude (self rep.)	8001	0,77	0,18	0,10	1
Green Attitude (LC)	8001	0,77	0,14	0,05	1
Environmental concern	8001	0,57	0,25	0,17	1
Quality Attitude	8001	0,91	0,13	0,10	1
Brand Attitude	8001	0,56	0,24	0,10	1
Point of Sale attitude	8001	0,77	0,21	0,10	1
Security Attitude	8001	0,87	0,16	0,10	1
Fairness Attitude	8001	0,75	0,20	0,10	1
Price Attitude	8001	0,78	0,18	0,10	1
Ecolabel knowledge	8001	0,29	0,12	0,25	1
Age	8001	0,61	0,19	0,17	1
Education	8001	0,65	0,16	0,20	1
Gender (1=M)	8001	0,52	0,5	0	1

TABLE A.2. Correlation matrix of the indicators

	GP	GA _{sr}	GAL	Qual	Br.	POS	Sec.	Fair	Price	Env	Age	Edu	ELK	G
Green Purchases	1,00													
Green Att. (SR)	0,36	1,00												
Green Att. (LC)	0,41	0,52	1,00											
Env concern	0,08	0,13	0,13	1,00										
Quality Att	0,14	0,40	0,13	0,05	1,00									
Brand Att.	0,00	0,04	-0,06	-0,01	0,14	1,00								
Point of Sale Att.	0,17	0,24	0,16	0,03	0,30	0,36	1,00							
Security Att.	0,22	0,37	0,21	0,05	0,54	0,19	0,49	1,00						
Fairness Att.	0,34	0,59	0,40	0,09	0,31	0,09	0,32	0,40	1,00					
Price Att.	-0,12	0,13	-0,07	0,00	0,28	0,14	0,10	0,18	0,01	1,00				
Ecolabel knowl.	0,12	0,08	0,08	0,01	-0,01	0,11	0,07	0,03	0,06	0,04	1,00			
Age	0,17	0,05	0,14	-0,03	0,02	0,06	0,11	0,07	0,05	-0,06	0,03	1,00		
Education	-0,05	-0,03	-0,08	-0,04	0,00	-0,06	-0,12	-0,11	0,00	-0,06	-0,11	-0,20	1,00	
Gender (1=M)	-0,04	-0,04	-0,07	0,01	-0,04	0,06	0,02	-0,03	-0,05	0,01	0,03	0,26	-0,11	1,00

TABLE A.3.: The regression for GP when proxying Green Attitude with “LC-GA”

y=Green Purchases	<i>Coeff.</i>	<i>Std. Err.</i>	<i>t</i>	<i>p</i>
Green Attitude (LC)	0,211	0,008	26,06	0,000
Env concern	0,010	0,004	2,27	0,023
Quality Attitude	0,033	0,010	3,40	0,001
Brand Attitude	-0,012	0,005	-2,71	0,007
Point of Sale Attitude	0,015	0,006	2,44	0,015
Security Attitude	0,049	0,009	5,65	0,000
Fairness Attitude	0,085	0,006	13,69	0,000
Price Attitude	-0,070	0,006	-11,70	0,000
Eco Label Knowledge	0,080	0,009	9,18	0,000
Age	0,061	0,006	10,65	0,000
Education	0,003	0,007	0,49	0,622
Gender (M)	-0,007	0,002	-3,48	0,001
C	0,404	0,012	34,59	0,000

n=8001, Adj R-squared = 0.245

Strikethrough text indicates n.s. variables

TABLE A.4.: The regression for Green Attitude when proxying it with “LC-GA”

y=Green Attitude (LCA)	<i>Coeff.</i>	<i>Std.Err.</i>	<i>t</i>	<i>p</i>
Env concern	0,054	0,006	9,31	0,000
Quality Attitude	0,009	0,014	0,65	0,515
Brand Attitude	-0,066	0,006	-10,43	0,000
Point of Sale	0,022	0,008	2,56	0,010
Security Attitude	0,053	0,012	4,46	0,000
Fairness Attitude	0,258	0,008	32,09	0,000
Price Attitude	-0,061	0,008	-7,37	0,000
Eco Label Knowledge	0,079	0,012	6,66	0,000
Age	0,095	0,008	12,05	0,000
Education	-0,055	0,009	-5,81	0,000
Gender (M)	-0,024	0,003	-8,11	0,000
C	0,527	0,015	35,07	0,000

n=8001, Adj R-squared = 0.2193

Strikethrough text indicates n.s. variables